REMARKS

This communication is in response to the Office Action mailed April 4, 2008.

The Office Action rejected claim 18-20 and 22-24 under 35 U.S.C. § 112, second paragraph. Applicant has amended the claims which are believed to be supported by the specification. Applicant respectfully requests that the 35 U.S.C.§ 112, second paragraph, rejections of claims 18-20 and 22-24 be withdrawn. If further amendments are needed, Applicant invites the Examiner to contact Applicant's attorney to discuss any further changes.

The Office Action rejected claims 1-3, 5-7, 18-20, 22-24 and 28 as being obvious over the combination of the Peljto et al. U.S. Patent No. 7,299,212 in view of the Cheliotis et al. U.S. Patent Application Publication No. 2005/0278,262. Pelijto et al. describe an apparatus for resolving energy imbalance requirements in real-time. When resolving this problem in real-time, Pelijto et al. simply can not simulate, nor would one modify this apparatus to simulate energy flow as recited by claim 1. In addition, Applicant also respectfully transverses the obviousness rejection of the above claims because the Peljto patent is not prior art to the present application. Applicant is submitting herewith declarations under 37 C.F.R. § 1.131 of Barend Den Ouden and Ferry van Looijendoed that proves that Applicant conceived of the invention prior to the earliest filing date of the Peljto patent, March 11, 2002, and diligently prepared and filed a patent application, the priority of which is claimed in this application.

For the forgoing reasons claims 1-3, 5-7, 18-20, 22-24 and 28 are allowable over the cited prior art. Reconsideration and allowance of claims 1-3, 5-7, 18-20, 22-24 and 28 are respectfully requested. With this amendment, new claims 29-32

have been added, and are believed to read on the elected species. These claims use language similar to those discussed above and are believed allowable for similar reasons.

Applicant also requests that withdrawn claims 4, 8, 9, 21, 25 and 26, which are a species of the genus claimed in claims 1 and 18, also be reconsidered and allowed.

These remarks are not to be considered exhaustive of the facets of the invention which are rendered patentable. For the foregoing reasons, applicant reserves the right to submit additional evidence showing the distinction between applicant's invention to be unobvious in view of the prior art.

For the foregoing reasons, Applicant submits that the present application is in allowable form. Allowance of the present application is respectfully requested.

An extension of time is hereby requested for consideration of this response. An online charge authorization is submitted herewith for the extension of time fee.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: _____

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SMK:PJI:dkm

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor : Barend Den Ouden	Group Art Unit: 3628
Appln. No.: 10/777,446	Examiner: Borissov, Igor N.
Filed : February 12, 2004	
For : A METHOD AND A COMPUTER PROGRAM FOR REGULATING THE ENERGY FLOW IN AN ENERGY NETWORK, AND AS WELL AS A SYSTEM FOR ELECTRONICALLY AUCTIONING ENERGY	
Docket No.: A78.12-0001	

DECLARATION OF FERRY van LOOIJENGOED UNDER 37 CFR 1.131

I, Ferry van Looijengoed, do declare as follows:

1. I am an attorney at the firm of DeVries & Metman located in Amsterdam, The Netherlands. I have first hand knowledge of the facts contained herein.

2. From the March 2002 up until the filing of the priority application on September 4, 2002, I met with Mr. Den Ouden and continued to correspond with Mr. Den Ouden regarding the subject matter of the present application, prior art and drafts of the present application. Some examples include:

In March 2002, I met with Mr. Den Ouden regarding the subject matter of present application. At that meeting I suggested, and Mr. Den Ouden agreed to prepare, a document for the invention of Exhibit A in more technical terms, which is required in Europe.

On or about May 16, 2002 I was informed by APX that Mr. Den Ouden was still working on the document.

On or about July 8, 2002 I received the document;

On or about July 31, 2002 I communicated search results relating to the invention to Mr. Den Ouden;

On or about August 1, 2002 I received comments from Mr. Den Ouden concerning the search results, whereafter I began drafting the application that was filed on September 4, 2002;

On or about August 16, 2002 I forwarded a draft of the application to Mr. Den Ouden for review;

On or about August 23, 2002 I met with Mr. Den Ouden to discuss the draft of the application;

On or about August 29, 2002 I incorporated Mr. Den Ouden's comments into the application and sent a second draft to him.

On or about September 2, 2002, I received further comments from Mr. Den Ouden.

3. On September 4, 2002, the application that I drafted which contained the subject matter of the present application was filed with The Netherland's Patent Office.

I declare that all statements made herein that are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: October 3, 2008

By: _____
Ferry van Looijengoed

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor :Barend Den Ouden	Group Art Unit: 3628
Appln. No.:10/777,446	Examiner:Borissov, Igor N.
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Docket No.:A78.12-0001	

DECLARATION OF BAREND DEN OUDEN UNDER 37 CFR 1.131

I, Barend Den Ouden, do declare as follows:

1. Prior to March 11, 2002, I was employed by Amsterdam Power Exchange Spotmarket B.V. (which subsequently changed its name to APX B.V.). I currently am CEO at APX B.V. and invented the subject matter of the present application. I have first hand knowledge of the facts contained herein.

2. I have reviewed the claims as presented in the amendment submitted herewith and the application to which it pertains.

3. I conceived of the invention claimed in the present application prior to March 11, 2002.

4. Prior to March 11, 2002, I authored the document identified as Exhibit A entitled Flexible Market Coupling A method for step-by step integration of electricity markets in Europe with Attachments A and B provided as evidence, where confidential information has been redacted.

5. I met with Mr. Ferry van Looijengoed, an attorney at DeVries & Metman, in March 2002 regarding the disclosure and claimed invention of the present application and continued to work with Mr. van Looijengoed up and until the priority application was filed on September 4, 2002 with The Netherland's Patent Office.

I declare that all statements made herein that are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 3rd October 2008 By: Barend Den Ouden

Flexible Market Coupling

A method for step-by step integration of electricity markets in Europe

B. den Ouden
Amsterdam Power eXchange Spotmarket BV

Comprehensive summary

In the discussion on the electricity market in Europe, there is an intense, sometimes rather vigorous discussion on the allocation of cross-border capacity. In particular, there is high difference of opinion on the question if capacity should be auctioned explicitly (by TSO's) or implicitly (by electricity exchanges).
According to the opinion of Amsterdam Power Exchange (APX), these possibilities do not exclude each other; it should be possible to find a syntheses. This paper describes a new and better way of cross-border optimization between electricity exchanges. This is called *"Flexible Market Coupling"* .It is an intermediate between the "Explicit auction method" and "Implicit auction method".
It allows for daily optimization of cross-border trading between exchanges as requested by market parties, based on previously purchased capacity in the TSO explicit capacity auctions.

The model has some elements of the "implicit auctioning" (also called market splitting) method, yet applied in a more flexible way. It does not require allocation of all capacity on a daily basis; merely, it functions well with the existing auctioning model in three terms: yearly, monthly and daily. The model is also applicable with different electricity exchanges in the different areas, with different trading systems, provided a certain level of co-ordination can be achieved.
Thus, the model allows for a step-by-step development towards more integration of the European electricity market, respecting the role of local and regional institutions.
Application of the model would reduce the risks for market parties, harmonize different price areas and create a better internal European Electricity market.
It is advisable to set up a further research aiming at performing a suitable experiment with the methodology.

1. Introduction

Cross-border electricity trading in Europe
Cross-border electricity trading is one of the most important items in the establishment of the internal European electricity market. It is often said that the full potential of that internal market is only fulfilled if there is a sound and liquid international exchange of electricity.
That perspective has been dimmed by the apparent fragmentation of the European electricity market. This is brought about by many factors, the most important being the limited physical transportation capacity across Europe. The interconnectors between the various TSO's were never designed to handle a full-blown European market.

Explicit cross-border auctions
Currently TSO's organize explicit auctions for allocation of cross-border capacity. This is essential for basic structural order to the cross-border trade. However, this is insufficient for bringing the European market together. There is merely a situation of multiple isolated markets, each in itself with limited liquidity. Something additional would be welcome in order to develop a more integrated European market with added liquidity and competition.

Implicit cross-border auctions
It is sometimes suggested to replace the explicit TSO auctions by an implicit auction, also called "market splitting". This method works well in the Nordic countries. It is not quite sure if this would work in central Europe. Allocation of all transport capacity on a daily basis without possibilities for forward contracting. is not what market parties currently want. Market splitting needs a highly developed market environment not yet available: e.g. a very liquid spot market in each individual area, sound financial markets, and a very high level of co-operation between all TSO's and exchanges. Physical conditions in central Europe like loop-flows provide further hindrances. It is conceivable to apply implicit auctioning in some regional solutions, but a fully developed integrated European system would be difficult to reach for some time.

The need for a flexible and auction-compatible interim solution: Flexible Market Coupling
A more moderate and flexible method for cross-border market integration would be welcome. We aim at the following characteristics:

- Facilitate market participants, allowing them to optimize and reduce their risks.
- The method would not replace current TSO auctions, but merely provide a useful addition to it and be compatible with it.
- Allow for constructive and step-by-step co-operation between the exchange operators and TSO's in Europe without demanding everything at once.
- Daily optimization of cross-border trading as wished by market parties, based on previously purchased capacity in the TSO explicit capacity auctions.

A model with these purposes has been developed by Amsterdam Power eXchange Spotmarket BV (APX). On the one hand this model is fully compatible with TSO auctions. On the other hand it introduces "market splitting" elements, but more flexible compared with the Nordic model. The model is called Flexible Market Coupling (FMC). It is conceived by B. den Ouden, CEO of Amsterdam Power Exchange. This paper presents purposes, principles and working of the model.

2. Principles of the "Flexible Market Coupling" (FMC) method

Flexible Market Coupling (FMC) is devised to achieve coupling of electricity hubs in Europe by introducing some elements of market splitting, but in a more flexible way.
The model works from the assumption that cross border capacity is primarily auctioned by TSOs, at least the capacity on monthly and yearly basis, and – in first instance – also the daily capacity.

The model establishes two basic facilities between two (or more) exchanges: the *Conditional Bid facility* and the *Market Coupling facility*.

- With the *Conditional Bid facility,* market participants owning auctioned transport capacity submit their cross-border trading volume to be optimized between the exchanges.
- The *Market Coupling facility* second facility is the optimizing model itself.

A. Conditional bid facility.

Up till now, the implicit auctioning method has mandatory allocated all capacity on a daily basis. In this model, no yearly and monthly auctioning is present. This is a hindrance for market parties. **In the Flexible Market Coupling, the capacity to be optimized may be determined by the market participants themselves: by putting in conditional inter-area bids, based on their capacity as purchased in the explicit TSO auctions for yearly, monthly and daily capacity.**

This is done by providing a facility of *conditional bidding* on exchanges on both sides of the border. This implies buying on one exchange and selling on the other (thus using the capacity), provided the price difference between exchanges is not opposite to the intended transportation.

This guarantees the following improvements over the current situation:

- The capacity owner has less risk on negative income: if the transport would lead to a negative result, the capacity need not be used. This also prevents unnecessary market distortion.
- All involved capacity is used as long as the market needs it, even if the capacity owner does not wish to use it himself. For this capacity, the owner gets the exchange prices difference.
- The facility automatically re-uses any leftover capacity as long as the market needs it, and guarantees "use it or loose it" based on exchange prices.
- The capacity owner may combine conditional bids with normal bids on both exchanges, thus constructing a total delivery path from one area to the other area, with price optimization.

Attachment A. shows a graphical presentation of the conditional bid facility and the way this may be used by the market participants for optimizing their portfolio.

It should be able to promote the system to traders, regulators and within Europe.

- Currently, traders have to allocate their capacity not knowing the cross-border price difference in advance, thus facing high risks. Conditional bidding reduces these risks.
- For regulators, the current situation is difficult. On the one hand they have to supervise the proper use of cross-border capacity and taking action against withholding capacity from the market. On the other hand, sometimes it is better for the market if

B. Market Coupling facility

Up till now the implicit auctioning method has been performed by one integrated exchange. **In the Flexible Market Coupling, daily capacity may be optimized between different exchanges, with different trading systems. This is done by the Market Coupling facility.**

Some synchronization is needed. Both exchanges should have an auction-based trading system, closing at the same hour (e.g. 10.30), with equal time units for price determination (e.g. hourly).

- At the same hour, both exchanges acquire the normal sale and offer bids, and conditional cross-border bids.
- Both exchanges calculate the basic hourly prices and volumes without the conditional bids. Also based on the normal bids, both exchanges each produce a price-dependency curve for imports or exports to or from the other area.
- Then the price-dependency curves for imports and exports are matched using the capacity in the conditional bids. This is done by one of the exchanges being the coordinating exchange.
- The outcome (e.g. the amount of conditional bids used) is then re-communicated to the individual exchanges in order to determine finally adapted hourly prices and volumes in their areas, compatible with the optimization of the conditional bids.

This generates the following advantages:

- A cross-border optimization between spot markets is possible, fully compatible with the current capacity auctions;
- There is no or little need for changing the TSO rules;
- Cross-border optimization can be accomplished between different exchanges, each retaining its individuality;
- The exchanges may even have different spot market systems as long as the systems both have an auction facility
- The exchanges involved are stimulated to work together, because of the added liquidity generated by this facility.
- The method of co-operation is modular; allowing for a step-by-step process for different European electricity exchanges working together, potentially producing a Europe-wide network.

Attachment B. gives a graphical presentation of the market coupling facility.

Optional implicit auctioning of daily capacity between the exchanges.
The inter-market coupling facility is suitable for optimizing capacity through the "conditional bid" facility: the parties are submitting the capacity previously purchased in explicit auctions. Alternatively, the method could also used for implicit auctioning of daily capacity between the cooperating exchanges.
In such a case, the TSO's would submit the daily capacity to the exchanges involved, to be implicitly auctioned - much like the Nordic "market splitting", but with differences: multiple cooperating exchanges instead of one integrated exchange; and a smaller part of total capacity, because the yearly and monthly capacity would still be explicitly auctioned.

3. Further thinking

More areas

The principles have been described with two areas and a common border. It may be extended to more areas, with the option to be extended to a fully compatible European network.

- For instance, take the case of three areas. Conditional bids can be put in on all common borders. Based on these bids, the multi-system market coupling can perform an optimization.
- If the three areas are in a linear sequence with two borders, the middle area potentially sees both imports and exports (transit) with both, one or none of the borders being constrained.
- If the three areas form a triangle, the optimization process has to be done one the three resulting borders, becoming somewhat more complicated but nevertheless feasible. Depending on the outcome there would be three different prices, or two different prices (because two areas have an unconstrained border) or one price for all areas.
- When more areas join the arrangement, the optimization process becomes more complex. It has to be studied to what extent a total optimization would be possible. The situation becomes simpler if there are borders which are always constrained or always non-constrained.

Attachment B gives a graphical representation of the possibilities encountered.

A broader system would have great advantages for traders. European electricity companies active in many areas could use the facility to transport electricity across all Europe. Combined with an ordinary selling bid in the area of origin and a buying bid in the area of destination, they would have an integral delivery path. In between all areas, they would put only conditional bids based on their previously purchased capacity in the TSO capacity auctions.

Block bids

The optimizing mechanism works for each hour or time unit individually. If block bids were involved, the mechanism would be distorted because then the outcome of the optimization process in one hour influences the other hours. This would make it difficult for the coordinating exchange to optimize independently. There are some alternative approaches to this problem:

- Allow no block bids in the hourly auction on both exchanges. Participants would need another instrument to optimize the blocks in each area, e.g. a secondary market with a continuous or adjustment character. However this would take liquidity away from the auctions and also be sub-optimal for the participants.
- Standardize block bids, so that all block bids in all areas have the same time periods. E.g. there would be 5 to 7 standard time blocks (so, unlike current APX situation, participants couldn't define block bids themselves). In addition to the hourly price dependency curves, individual exchanges would produce these also for the block periods. The coordinating exchange would optimize the cross-border including the blocks, based on the received curves for hours and blocks. For a multi-area situation the picture would become complicated; this has to be studied.
- Establish one integrated exchange for all areas involved. This is not an extra solution because this integrated exchange would still have to implement harmonized block bids. However, perhaps such an integrated exchange could implement the standardization more easily.
- Look for less-then-ideal solutions, nevertheless close to optimal. This would imply useful approximation methods, acceptable for the market and compatible with TSO requirements.

4. Further development and implementation

The model has high potential value for the electricity market in Europe. But the model has to be developed and proven yet. There are still many uncertainties and unclarities to be resolved.
It is proposed to develop this according to the following line:

1. A feasibility and definition project is started. This would describe the functional rules for the system (functional feasibility) and the necessary legal, regulatory and organizational requirements (regulatory feasibility). A preliminary test system should be built in order to check the practical possibilities and problems (technical feasibility). Also, the project should look at financial aspects: costs and benefits (financial feasibility).
2. An experiment is carried out. This would involve two exchanges and corresponding TSO's willing to perform the experiment in co-operation. Both exchanges would support the experiment and the participants of both exchanges would participate in the experiment. The experiment could be performed by APX using the preliminary test system. Ideally, the experiment should be carried out on one of the borders of the Benelux and another price area, supported by TenneT, Elia and the other TSO.
3. The experiment is evaluated; if it is successful, the solution (with amendments coming from the experiment) could be built for regular service.

It is proposed to ask for a subsidy for this project at suitable governmental and international level. The total cost of the project is roughly estimated at 500.000 Euro: 100.000 for phase 1 (excluding the preliminary test system), 150.000 for the preliminary test system, and 250.000 for the testing and evaluation in phase 2.

B. den Ouden
Amsterdam Power eXchange Spotmarket BV
[redacted]

Amsterdam Power Exchange

Flexible Market Coupling (FMC)

Attachment A: conditional inter area bid facility

B. den Ouden, Amsterdam Power Exchange Spotmarket BV

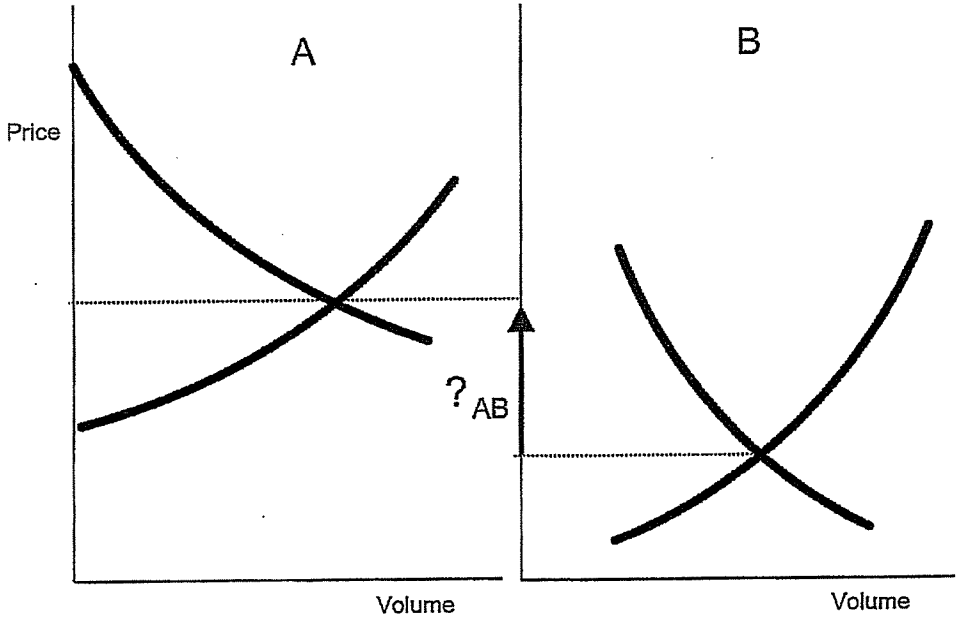
[redacted]

www.apx.nl

Conditional inter area bids

Sell at area A, buy at B as long as Ä(price) " 0

Amsterdam Power Exchange

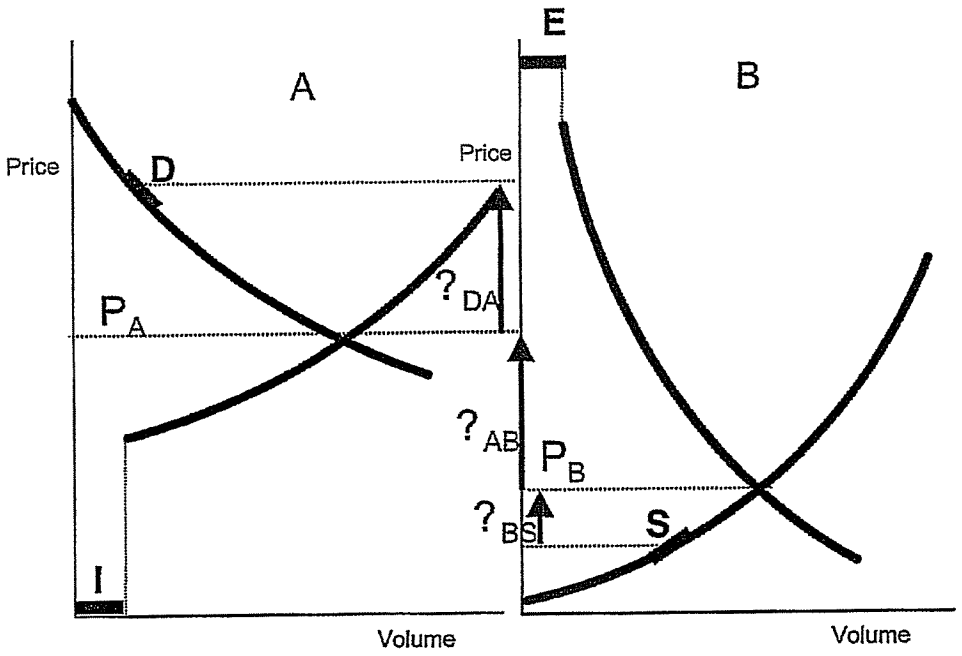


- Reduces price risks for traders
- No market distortions
- Uses capacity for the market, even when owners don't use it themselves
- Returns price difference to capacity owner
- Guarantees use it or loose it
- Capacity owners can combine with ordinary sell and buy bids in both areas in order to get full delivery with price optimization

Conditional inter area bids

Establishing full delivery path with optimization

Amsterdam Power Exchange

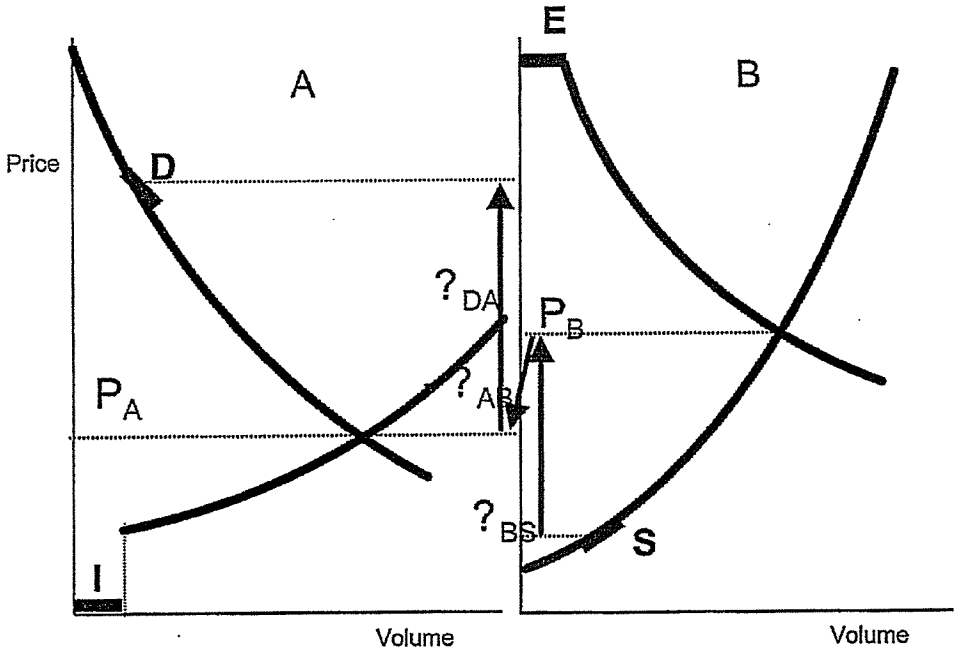


- Conditional bid: export from B (E), import in A (I)
- Limit bids: supply in B (S), demand in A (D)
- Revenue without FMC (just nominating the capacity): $P_{D(elivery)} - P_{S(upply)}$
- With FMC: deliver supply in B to demand in A using the cross border capacity. Revenue the same: $?_{DA} + ?_{AB} + ?_{BS} = P_D - P_S$

Conditional inter area bids:optimizing

Case of inverted area prices: Normal outcome

Amsterdam Power Exchange

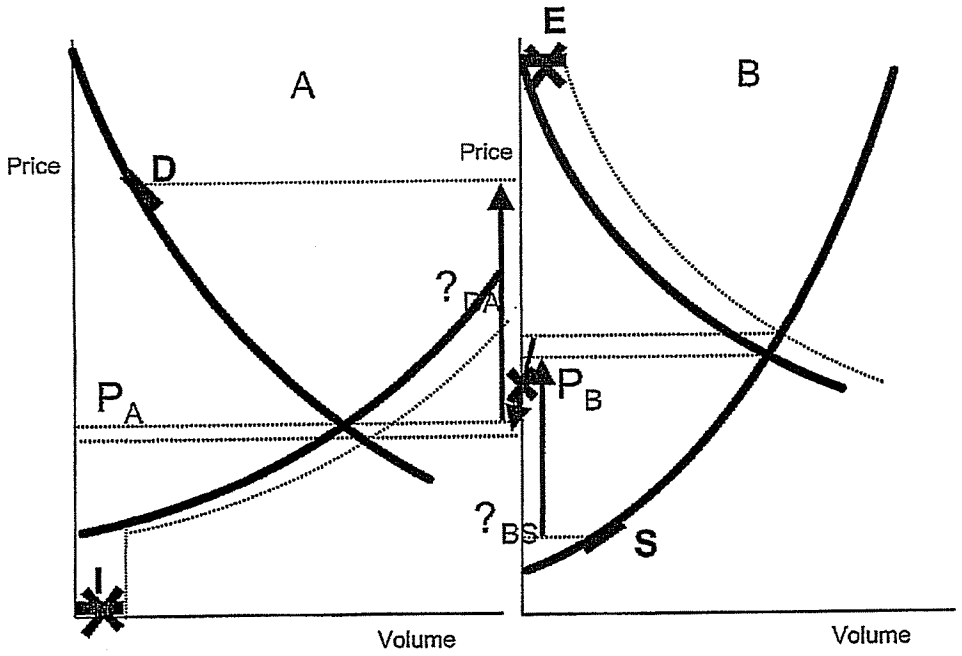


- Conditional bid: export from B (E), import in A (I)
- Limit bids: supply in B (S), demand in A (D)
- Revenue without FMC (just nominating the capacity): $P_D - P_S$ including negative $?_{AB}$

Conditional inter area bids:optimizing

Case of inverted area prices: FMC outcome

Amsterdam Power Exchange



- Conditional bid: export from B (E), import in A (I)
- Limit bids: supply in B (S), demand in A (D)
- Revenue without FMC (just nominating the capacity): $P_D - P_s$ including negative $?_{AB}$
- With FMC: deliver supply in B, demand in A *without* using the cross border capacity. Revenue: $?_{DA} + ?_{BS}$

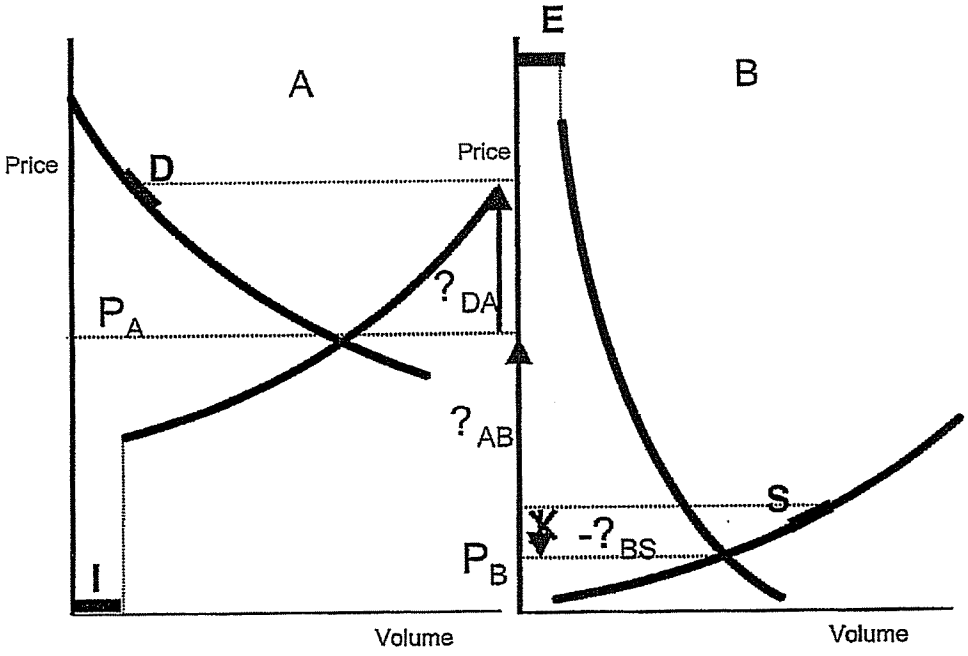
➢ Avoid negative income from cross-border $?_{AB}$

➢ Mitigated price inversion: no uneconomic im/exports ( )

Conditional inter area bids:optimizing

Case of low price in area of origin

Amsterdam Power Exchange



- Conditional bid: export from B (E), import in A (I)
- Limit bids: supply in B (S), demand in A (D)
- Revenue without FMC (just producing for price S: $P_{Delivery} - P_{supply}$ incl. negative revenue in area of origin
- With FMC: don't produce, buy from spot market in B, still supply demand in A using cross border capacity. Revenue: $(P_D - P_A) + ?_{AB}$

➢ Avoid negative income in area of origin B

Amsterdam Power Exchange

Flexible Market Coupling (FMC)

Attachment B: Market Coupling facility

B. den Ouden, Amsterdam Power Exchange Spotmarket BV

[redacted]

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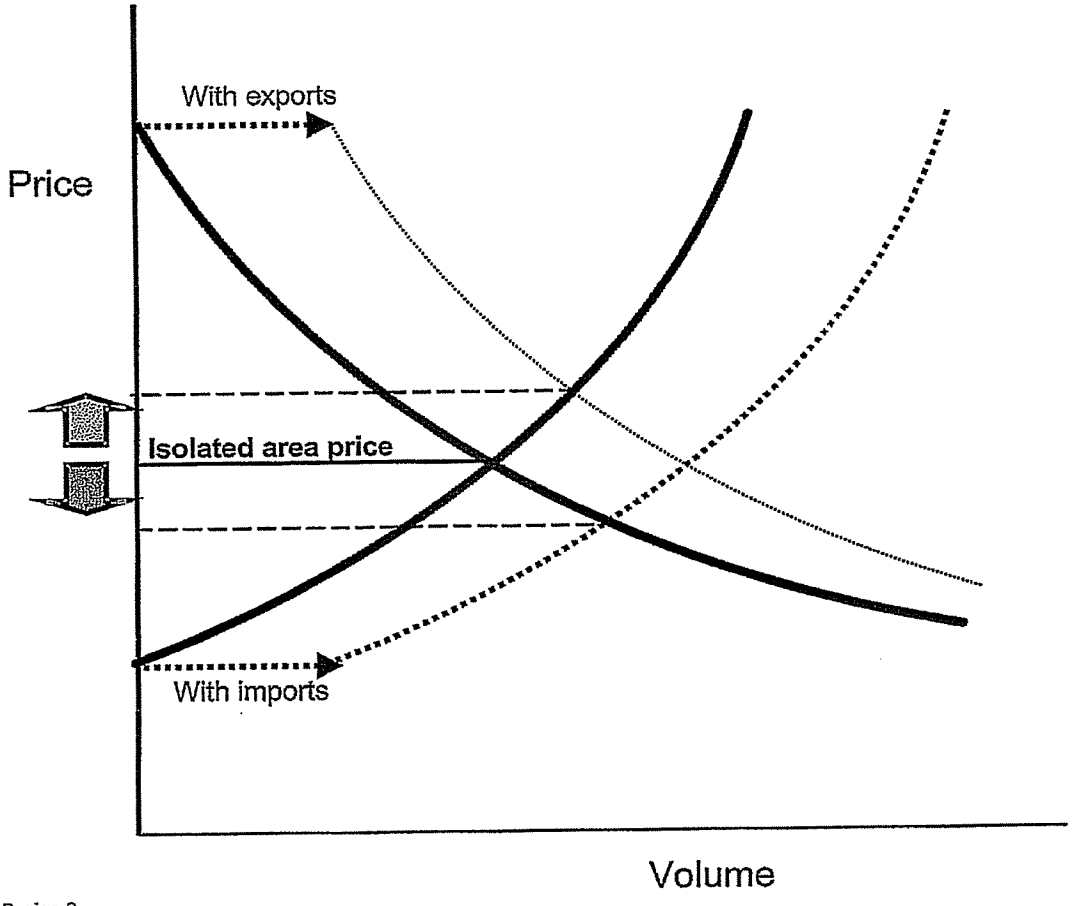
Market Coupling

exchange price varies with potential im/export

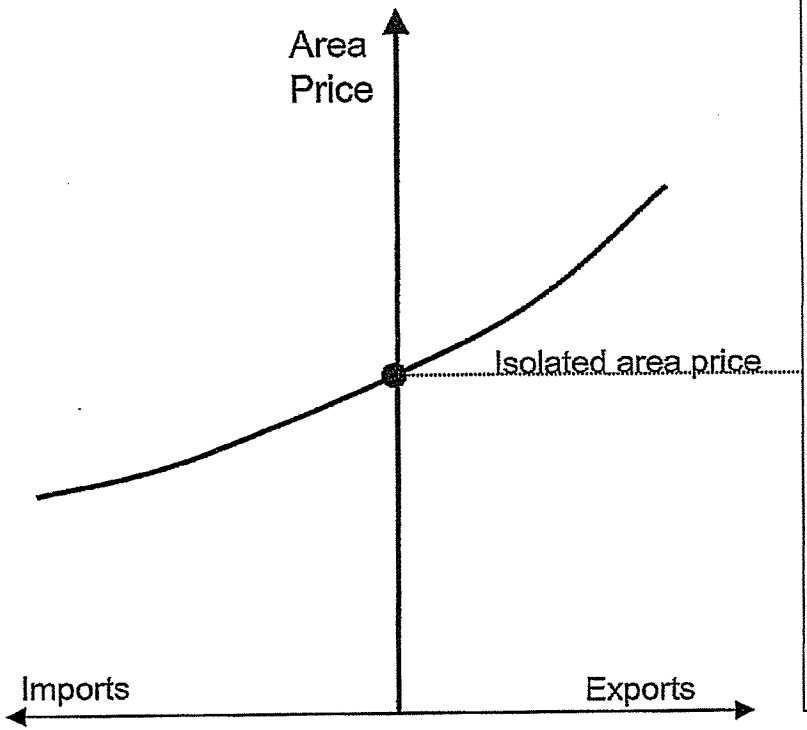
Amsterdam Power Exchange



Market Coupling

Exchange price im/export dependency curve

Amsterdam Power Exchange

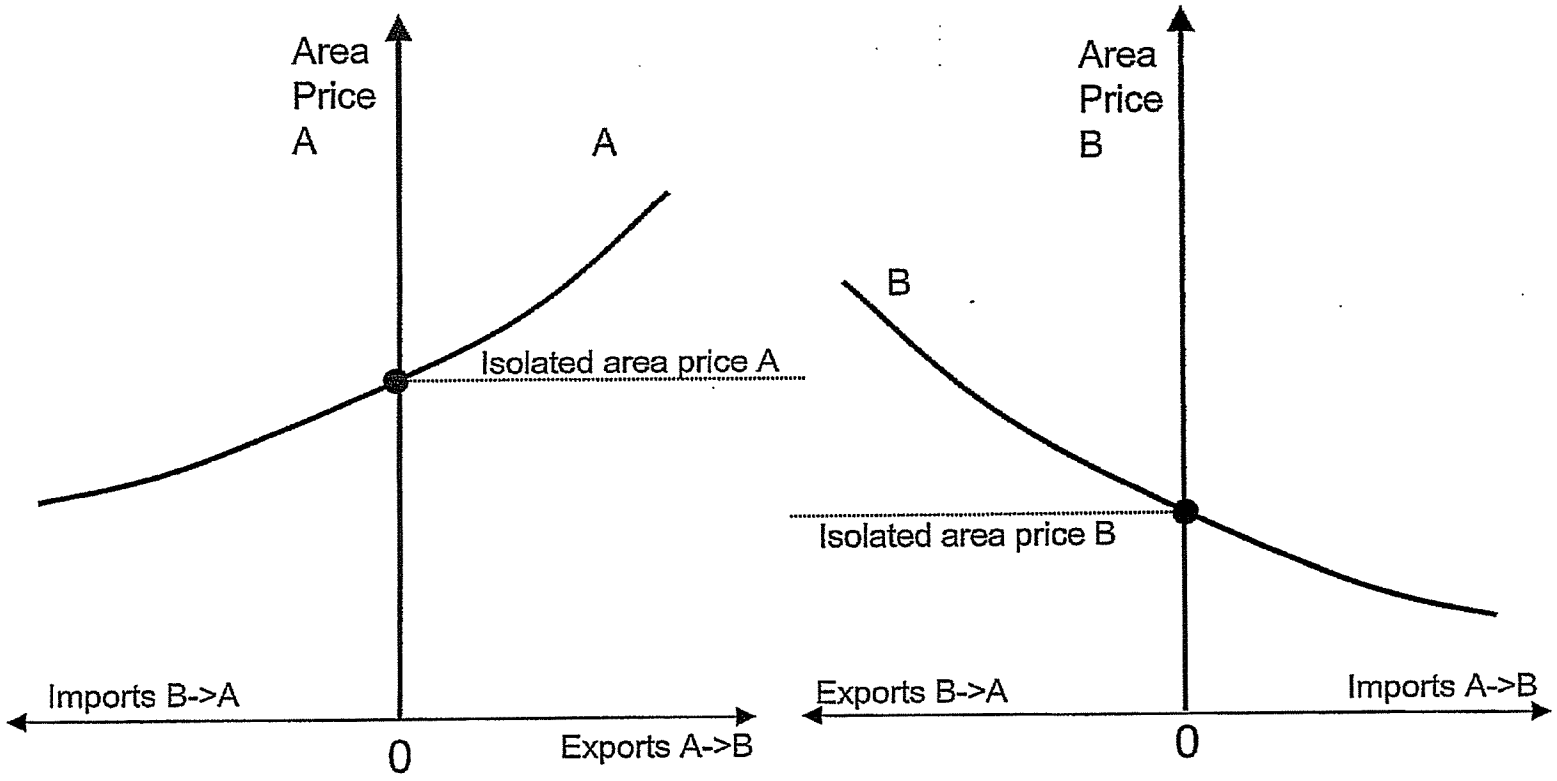


- Every exchange can produce a price curve dependency on im-exports
- Suitable for both a fully integrated situation or many independent exchanges
- Suitable for different trading systems

Market Coupling

Two exchanges with mutual im/exports

Amsterdam Power Exchange



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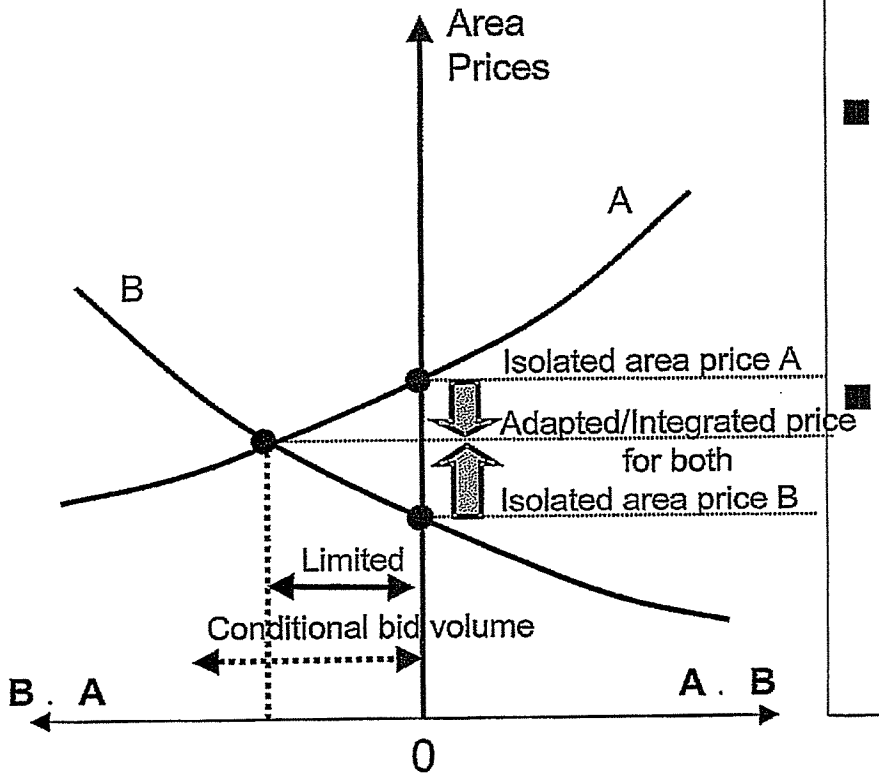
Market Coupling

cross-border equilibrium (unconstrained)

Amsterdam Power Exchange

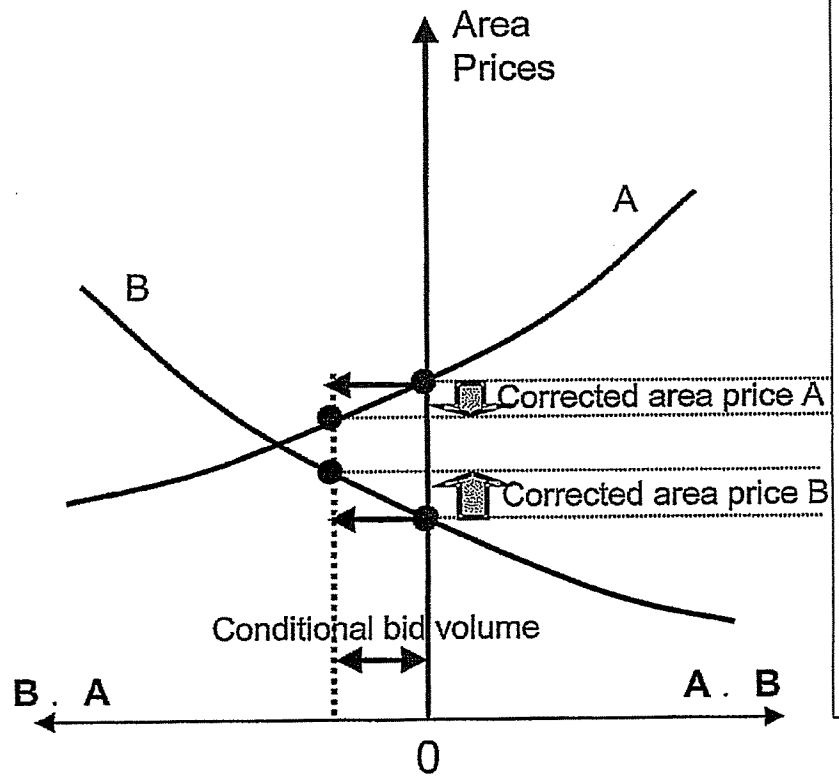


- Both exchanges produce im/export dependency curve.
- Coordinating exchange applies conditional bid volume. If no constraint, conditional bids are limited at curve intersection.
- Both exchanges recalculate their area prices with that limited conditional bid volume, giving one integrated price.

Market Coupling

cross-border equilibrium (constrained)

Amsterdam Power Exchange

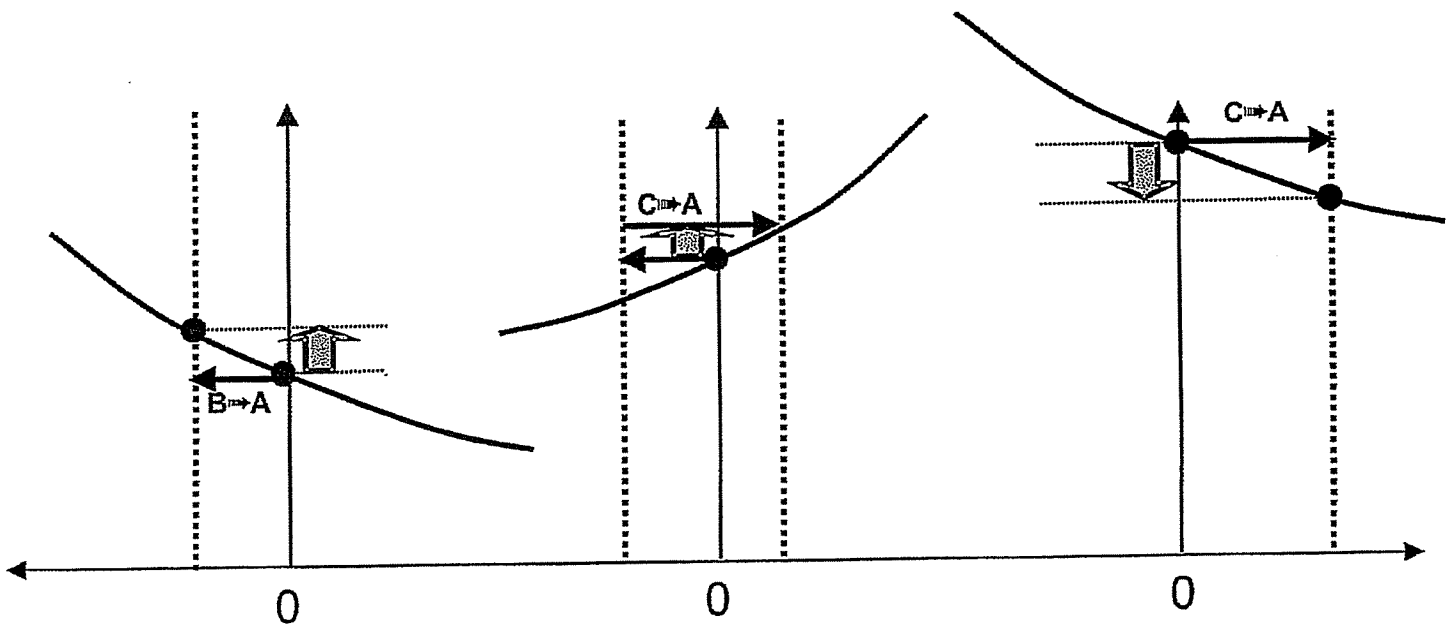


- Both exchanges produce im/export dependency curve.
- Coordinating exchange applies conditional bid volume. If constraint situation: all conditional bids are used; different exchange prices.
- Both exchanges recalculate their corrected area prices with total volume of conditional bids

Further thinking: more areas
three areas in linear row, two borders

Amsterdam Power Exchange

All borders constrained, middle area transit



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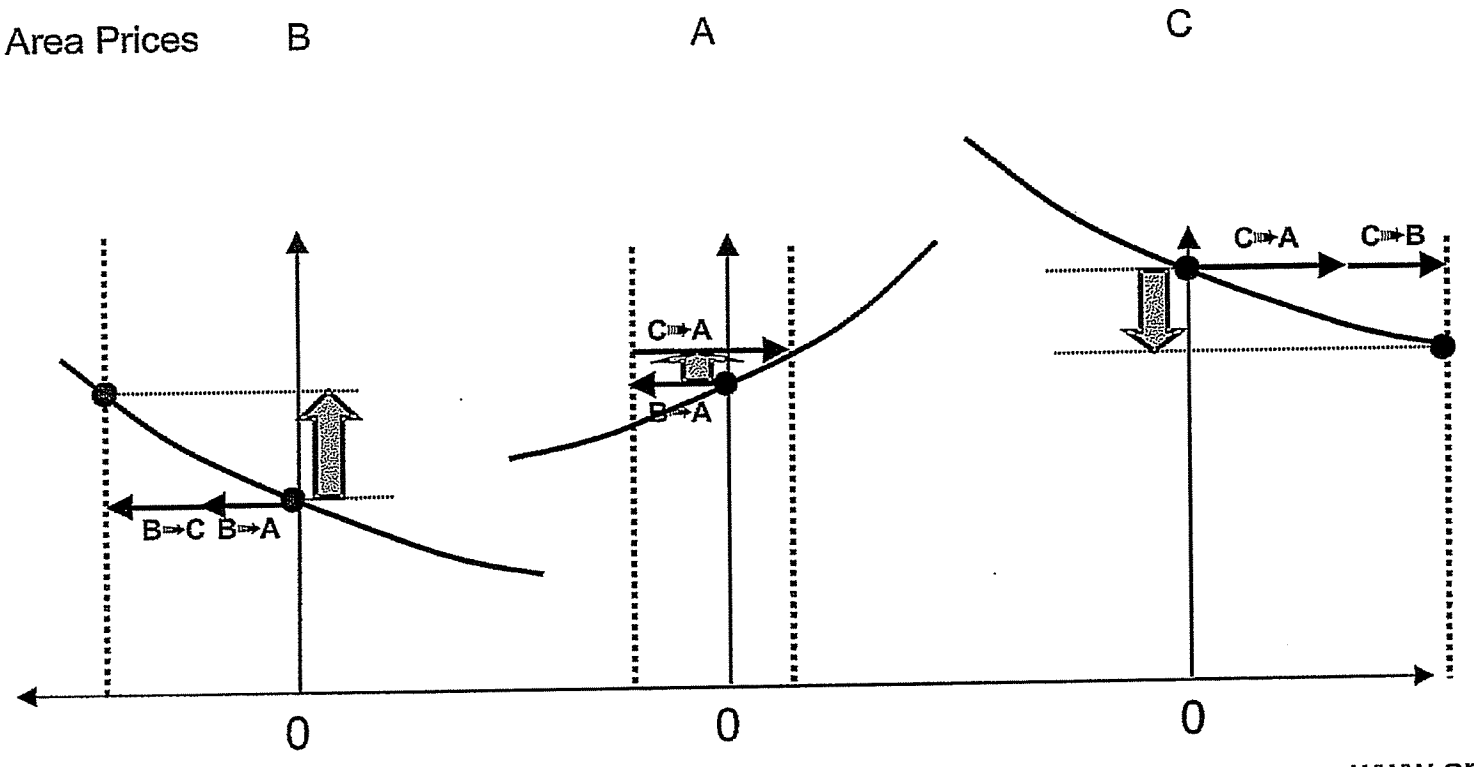
Further thinking: more areas
three areas in a triangle, three borders

Amsterdam Power Exchange

All borders constrained, one transit area



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